



Planting for a Rainy Day



THE UNIVERSITY OF ARIZONA
Cooperative Extension

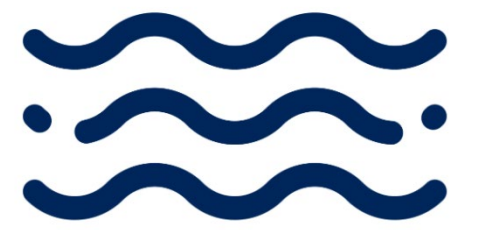
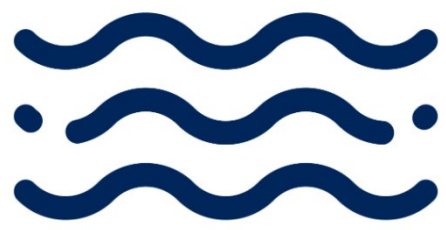
2025-2026



ARIZONA


project WET

WATER EDUCATION TODAY



Lesson 1: Estivation, Xerophytes, and Ephemerals

Investigative Questions

- How have the animals and plants living in Arizona adapted so that they can survive here?
 - How does transpiration and evaporation relate to plants' and animals' adaptations for water conservation and temperature management when living in Arizona?
 - What is a watershed and which watershed do you live in within Arizona?
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Thirsty Plants – Set-up: Lesson 1

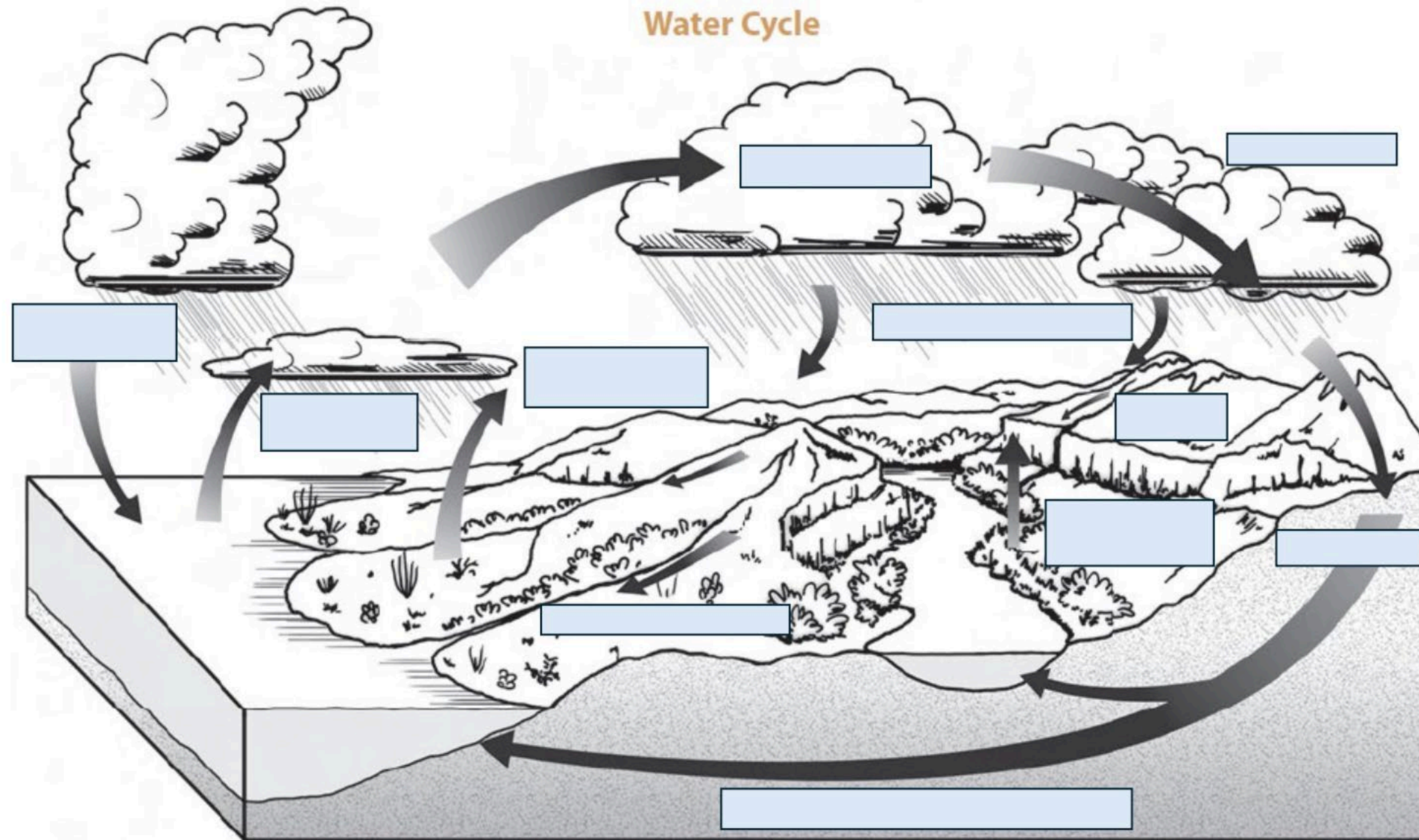
Experiment Time:

- Take students outside to an area with several plants (a variety is best).
- Have students carefully place the bag over several leaves of their plant, and zip the bag closed.
- Record their data on the worksheet.
- Make predictions and while you wait to check on your bags (approx. 60 minutes) proceed with rest of lesson.
- Tip – sunny days and spots will work best for this experiment!



Water Movement In the Water Cycle

Arizona Conserve Water



Artist: Rachel Ivanyi, © Project WET

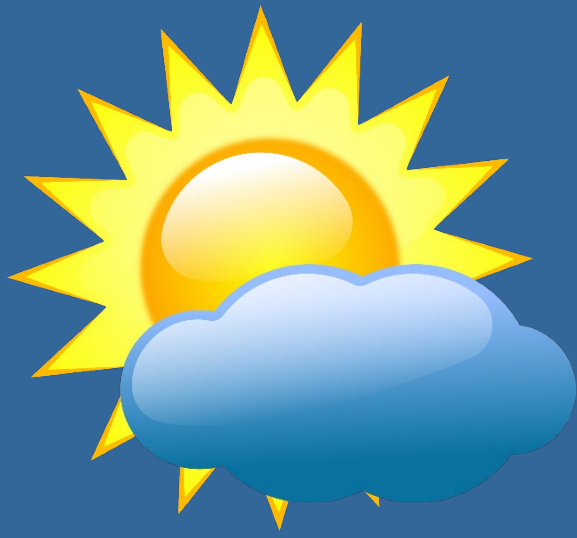
The properties of water drive the water cycle, which is fundamental to life on Earth. Developing strategies for water conservation depends on understanding the water cycle and the basic properties of water.

Investigative Questions:

- How does water move through our local water cycle?
- Are you a part of our water cycle ?
 - Does water move in and out of your body?

We live in a desert!





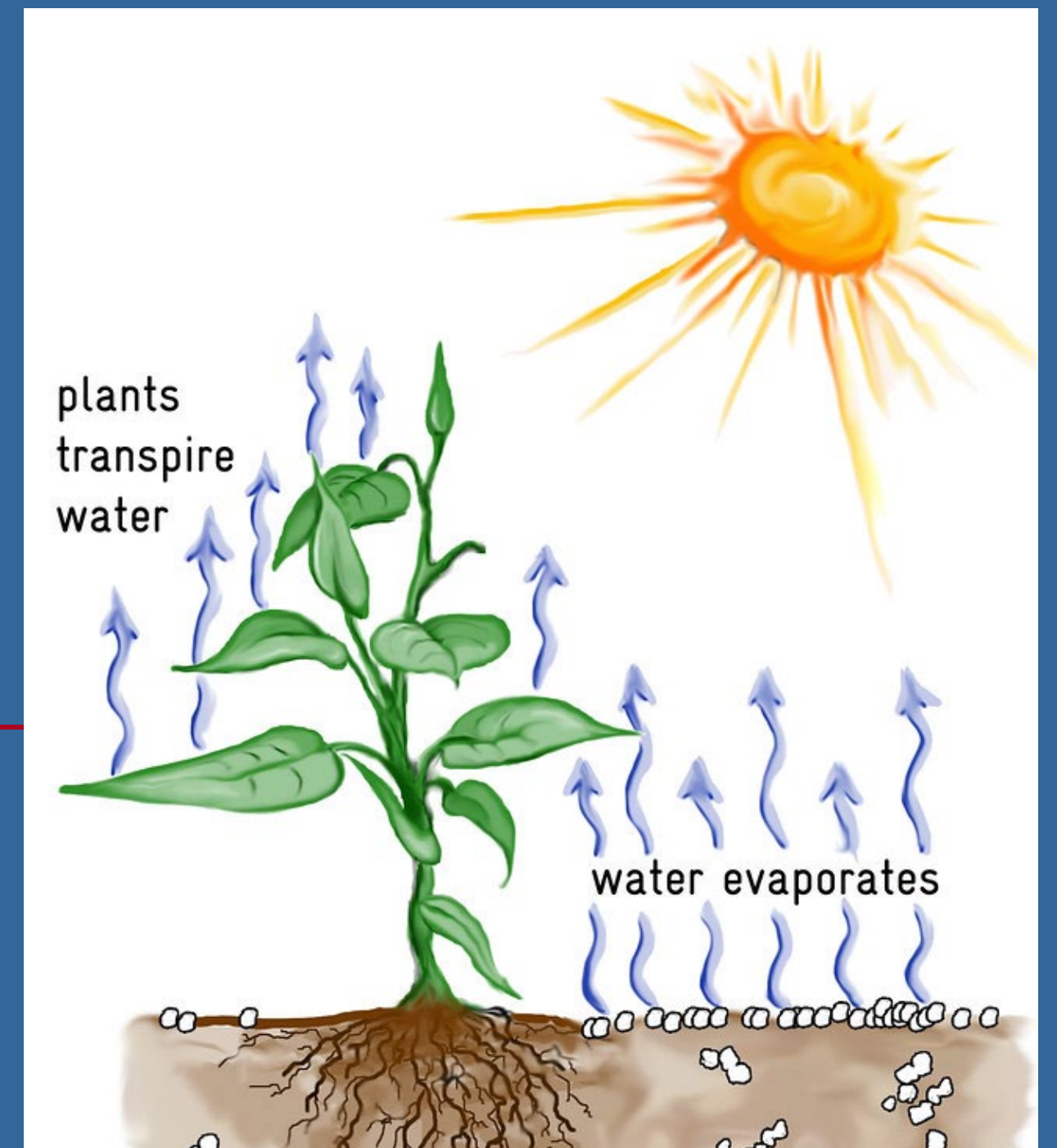
What is climate?

Is climate the same as weather?

- **Weather:** what happens day to day (temp, clouds, precipitation)
- **Climate:** is average measurements over several years
- **Climate** is what you expect, and **weather** is what you get

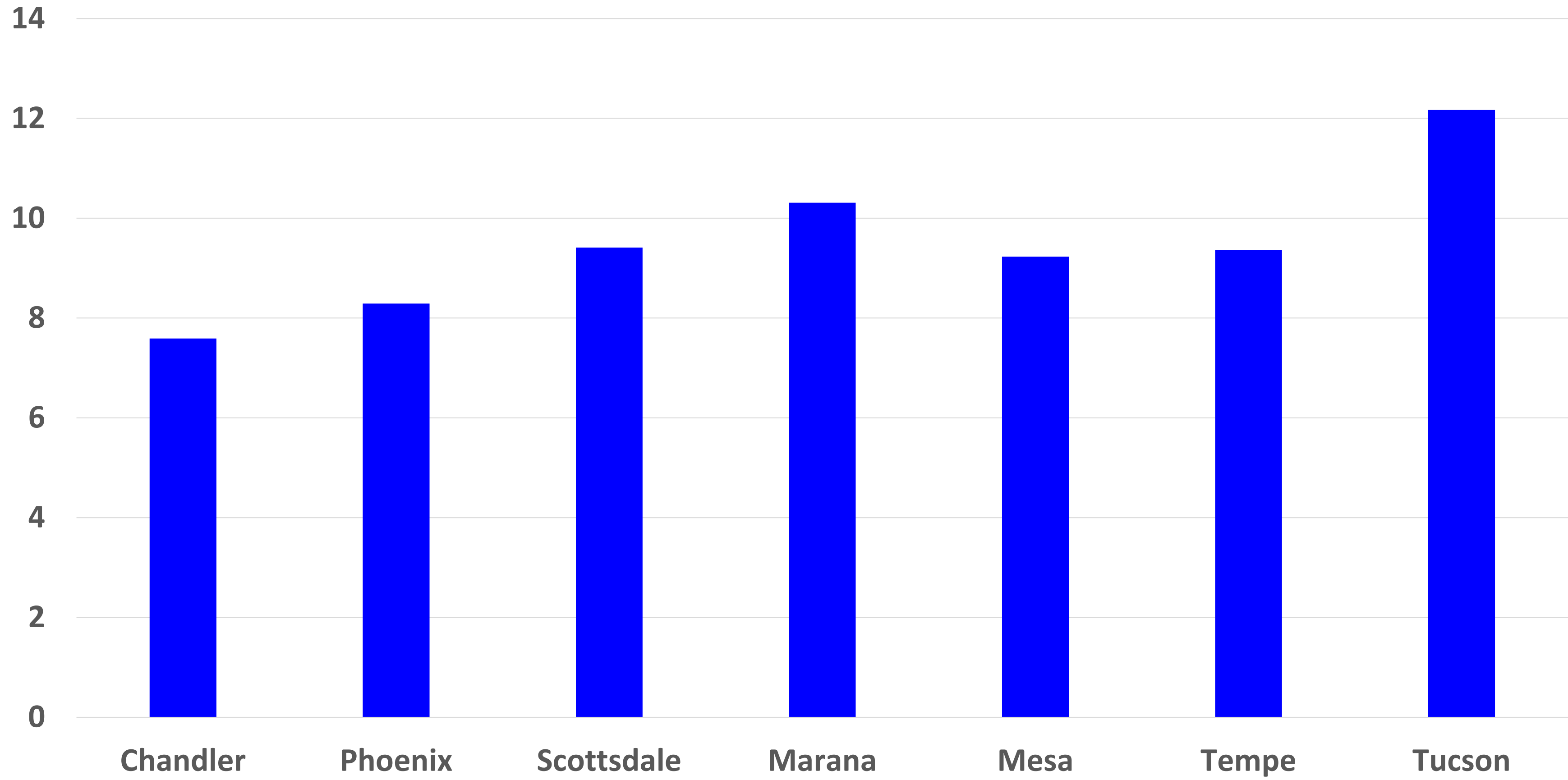
What is evapotranspiration?

- What is evaporation?
- What is transpiration?
- What form is water changing from and into during each process?



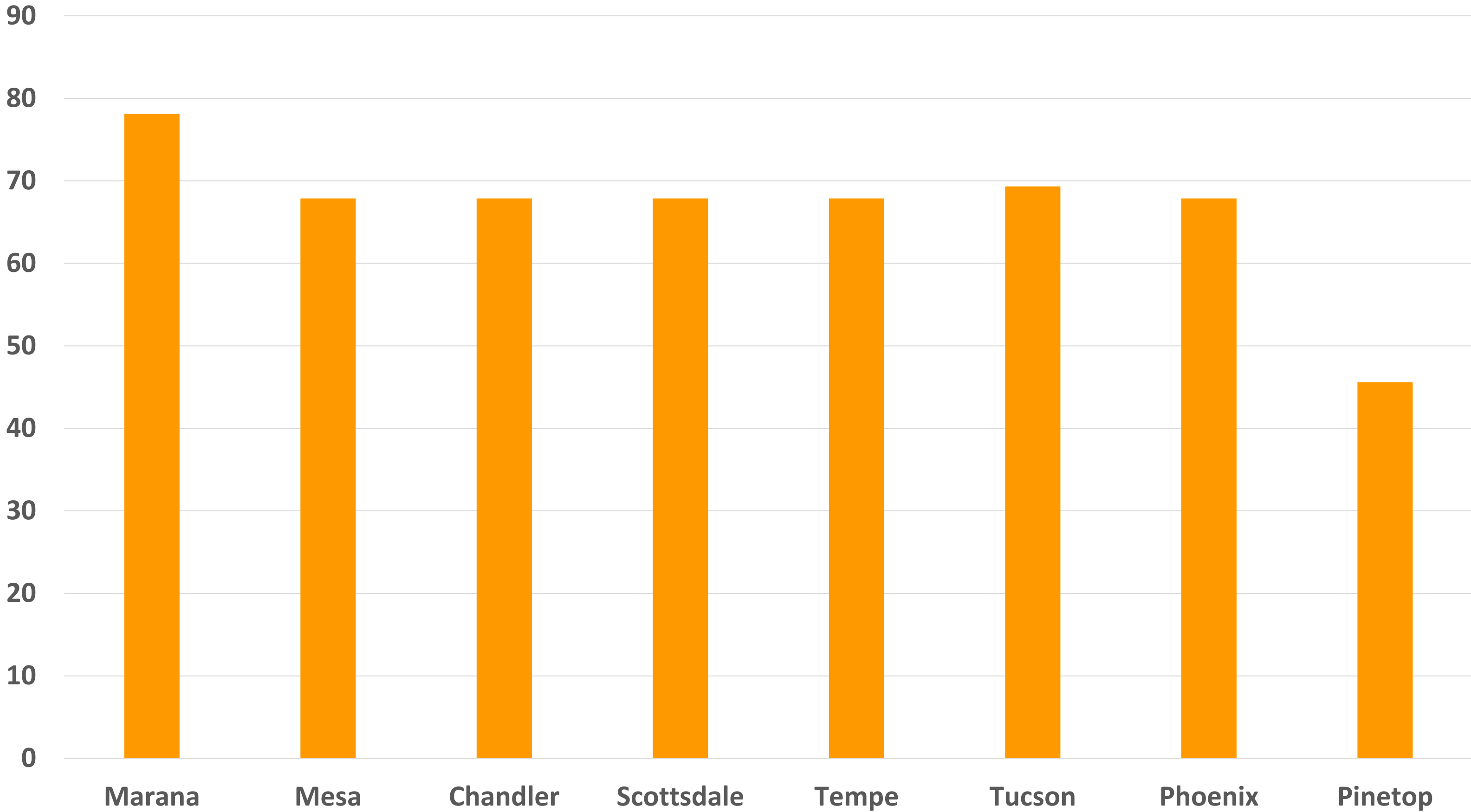


Annual Rainfall (inches)



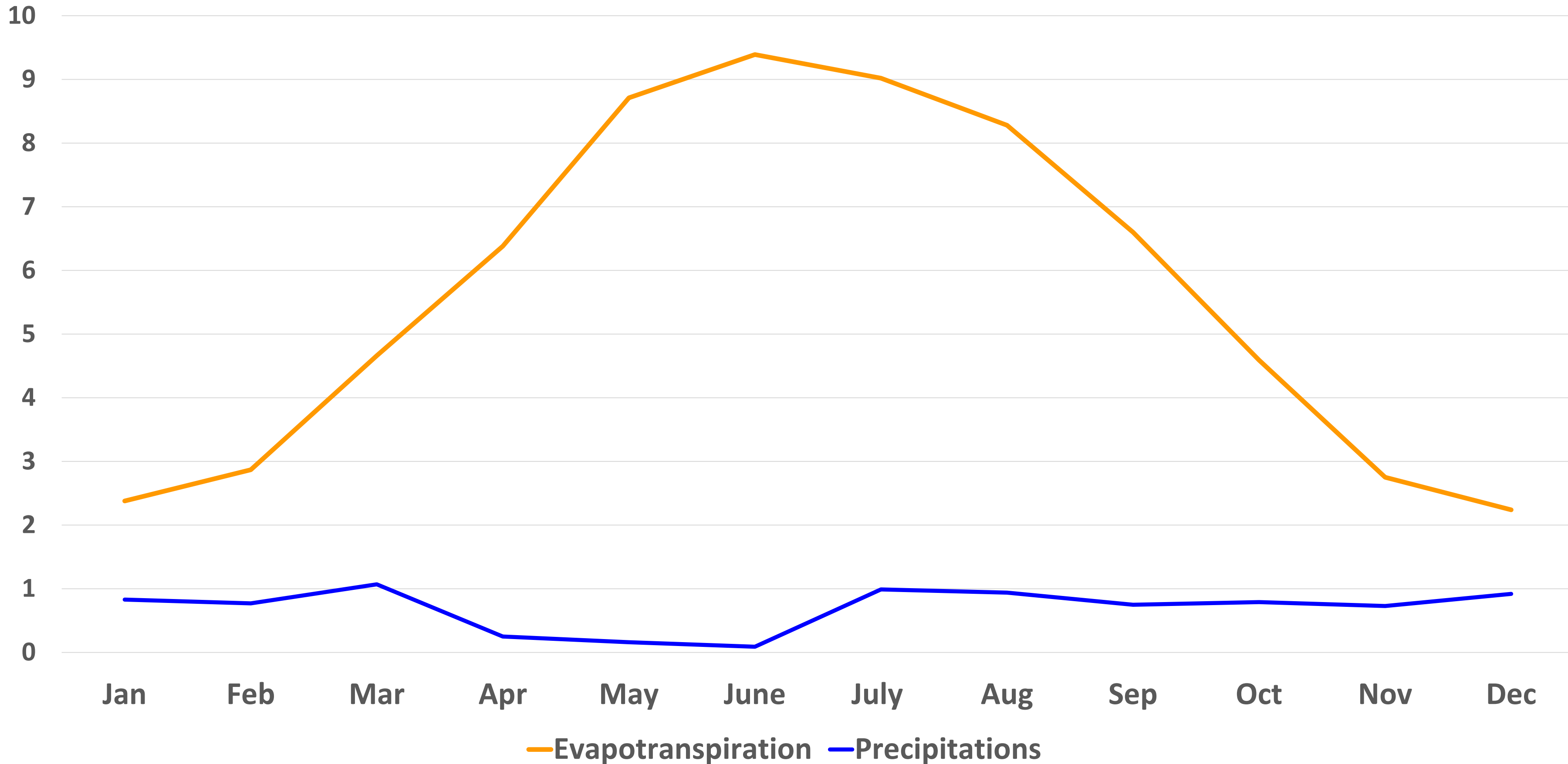


Annual Evapotranspiration (inches)





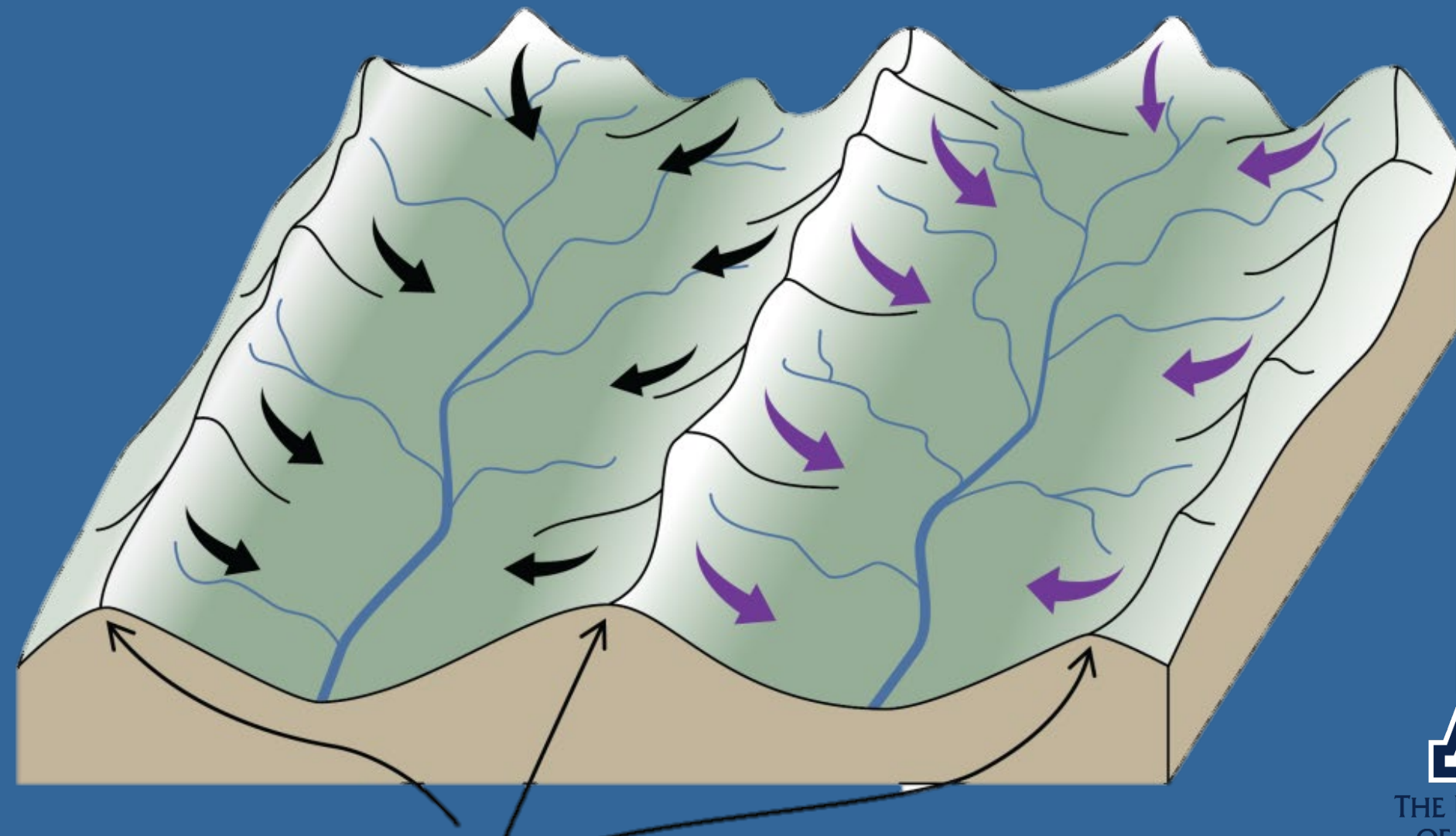
Phoenix Precipitation vs Evapotranspiration



Watersheds & Maps: Lesson 1

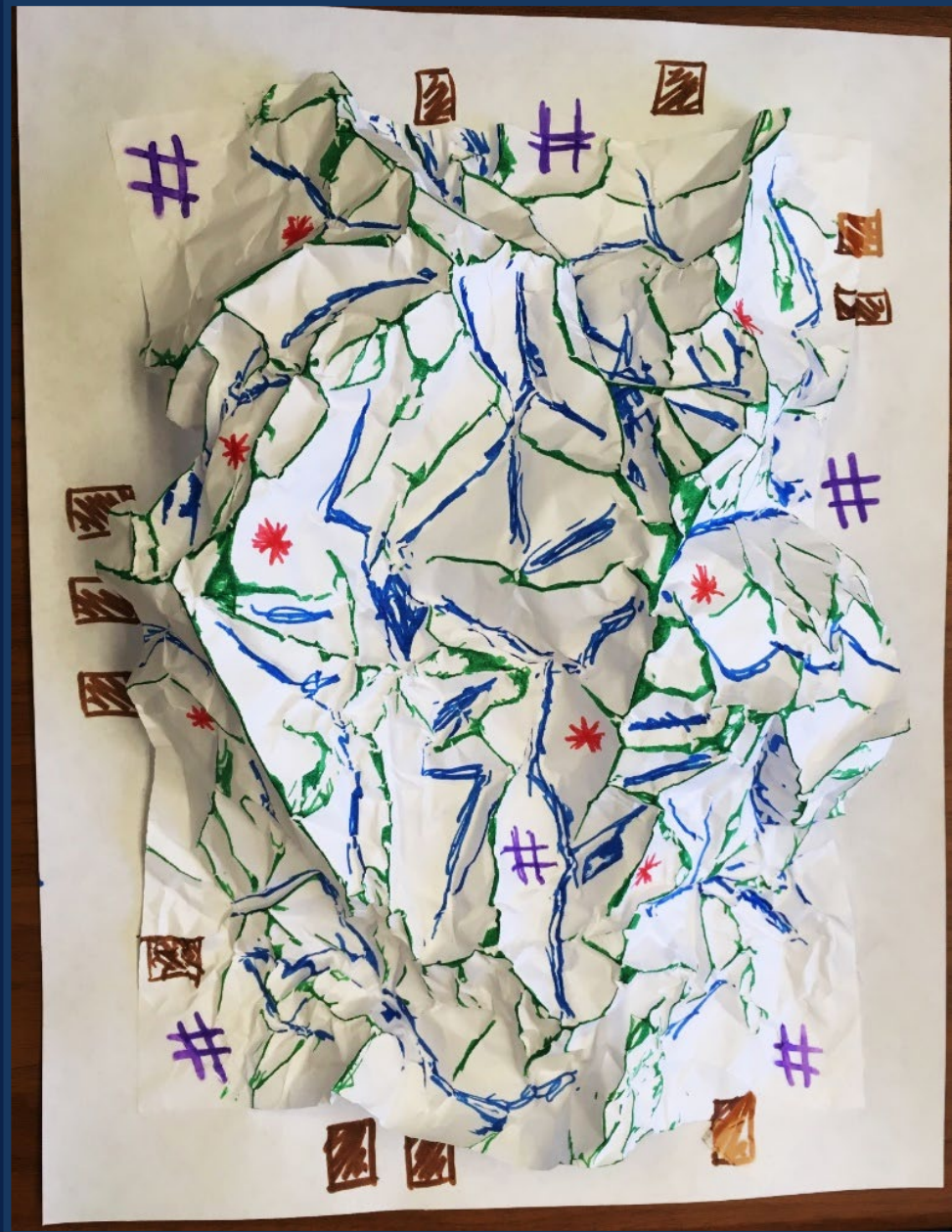
What is a Watershed?

A watershed is: a land area that **DRAINS** to the low points.



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Optional Activity: *Watersheds Work*



Key/Legend:

Ridges (along upfold) = **Green**

Valleys (along downfold) = **Blue**

Optional Colors:

Farms (colored area) = **Brown**

Old Mines (*) = **Red**

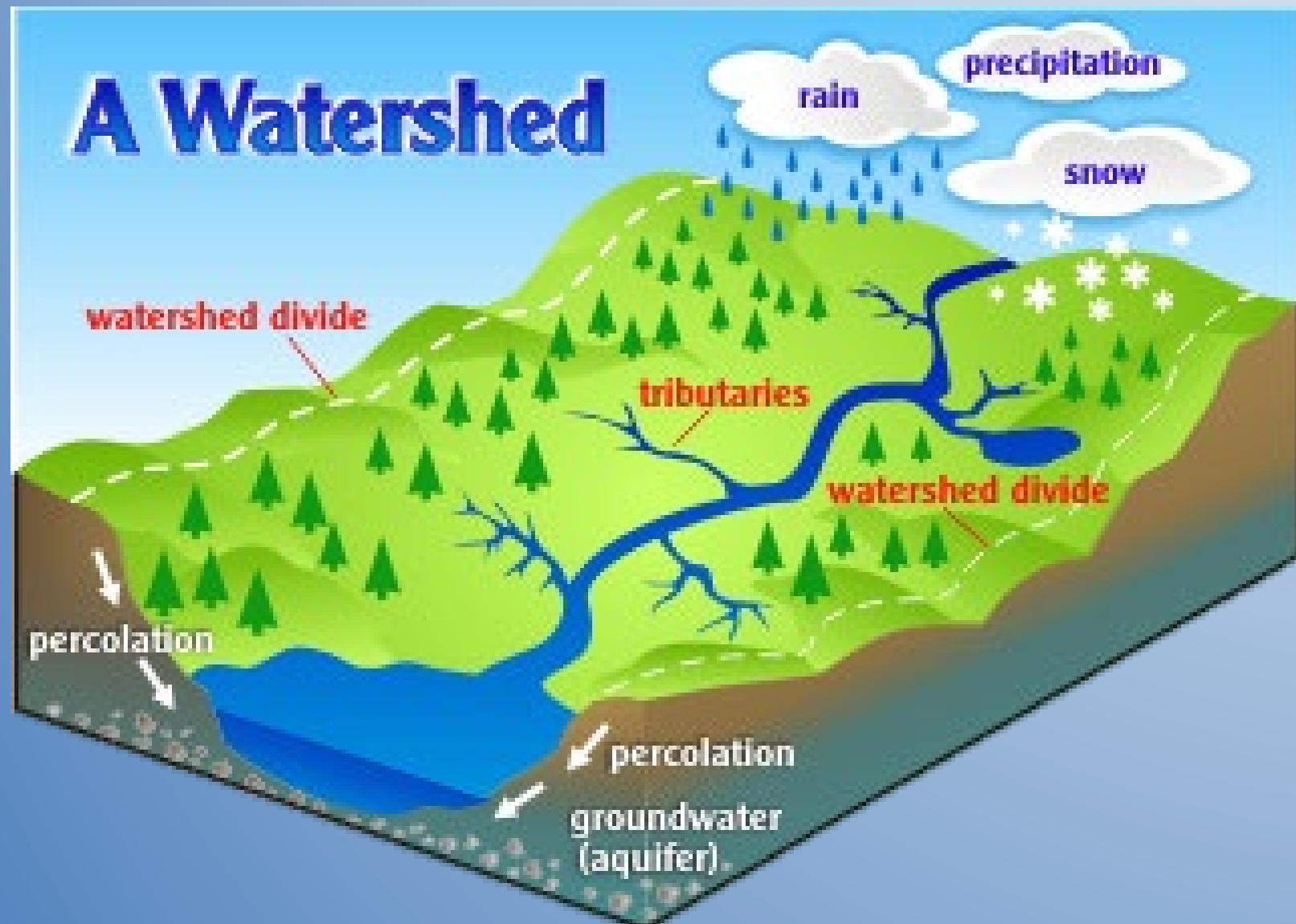
Cities (#) = **Purple**

Additional topics can be other colors

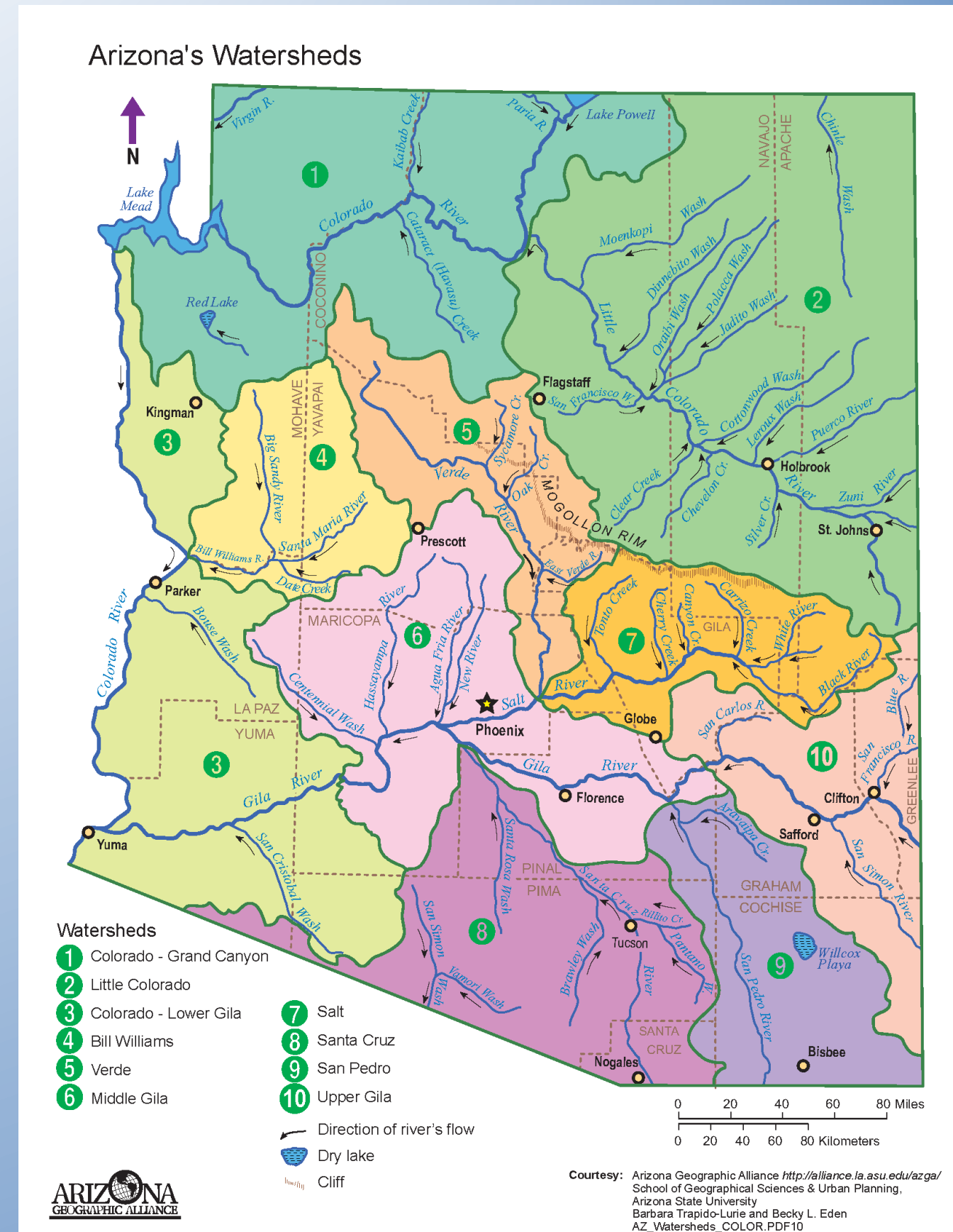


Watersheds & Maps: Lesson 1

What are we managing when we talk about watershed management?



The land and water in that area.



Amazing Adaptations: Lesson 1

Evaporation to cool & get water from food source



Estivation & Crepuscular

Nocturnal

Amazing Adaptations: Lesson 1

Plants Must Conserve Water & Stay Cool



Thick, fleshy, and waxy leaves or stems can help plants store more water.

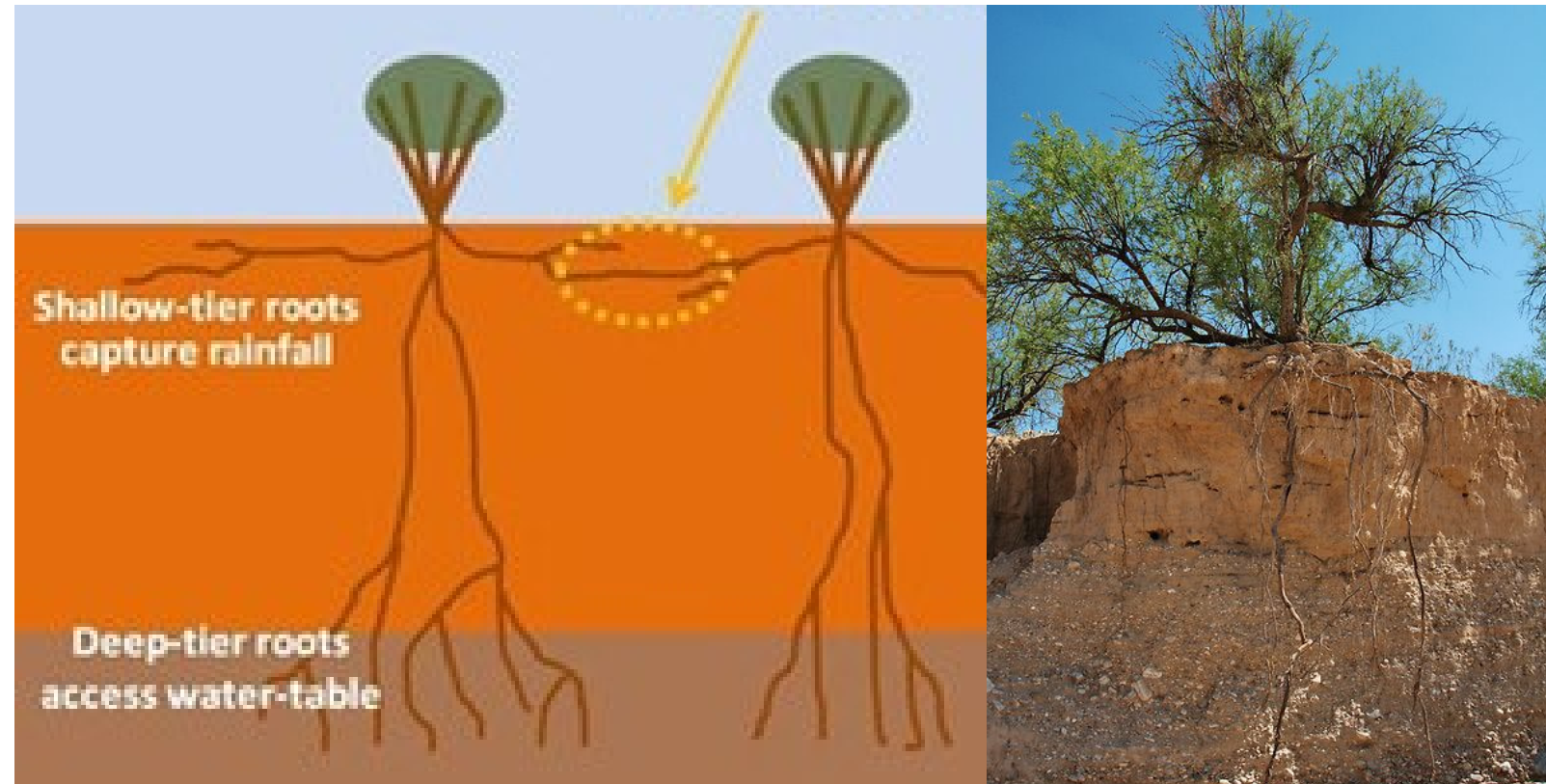
Xerophytes



Small, waxy, hairy leaves, or having spines help reduce water loss through evaporation.

Amazing Adaptations: Lesson 1

Phreatophytes



Some plants have extremely long roots that travel deep (tap root) to tap into deeper groundwater.

Perennials



Some survive by becoming dormant when hot and dry and then rejuvenating when it rains.



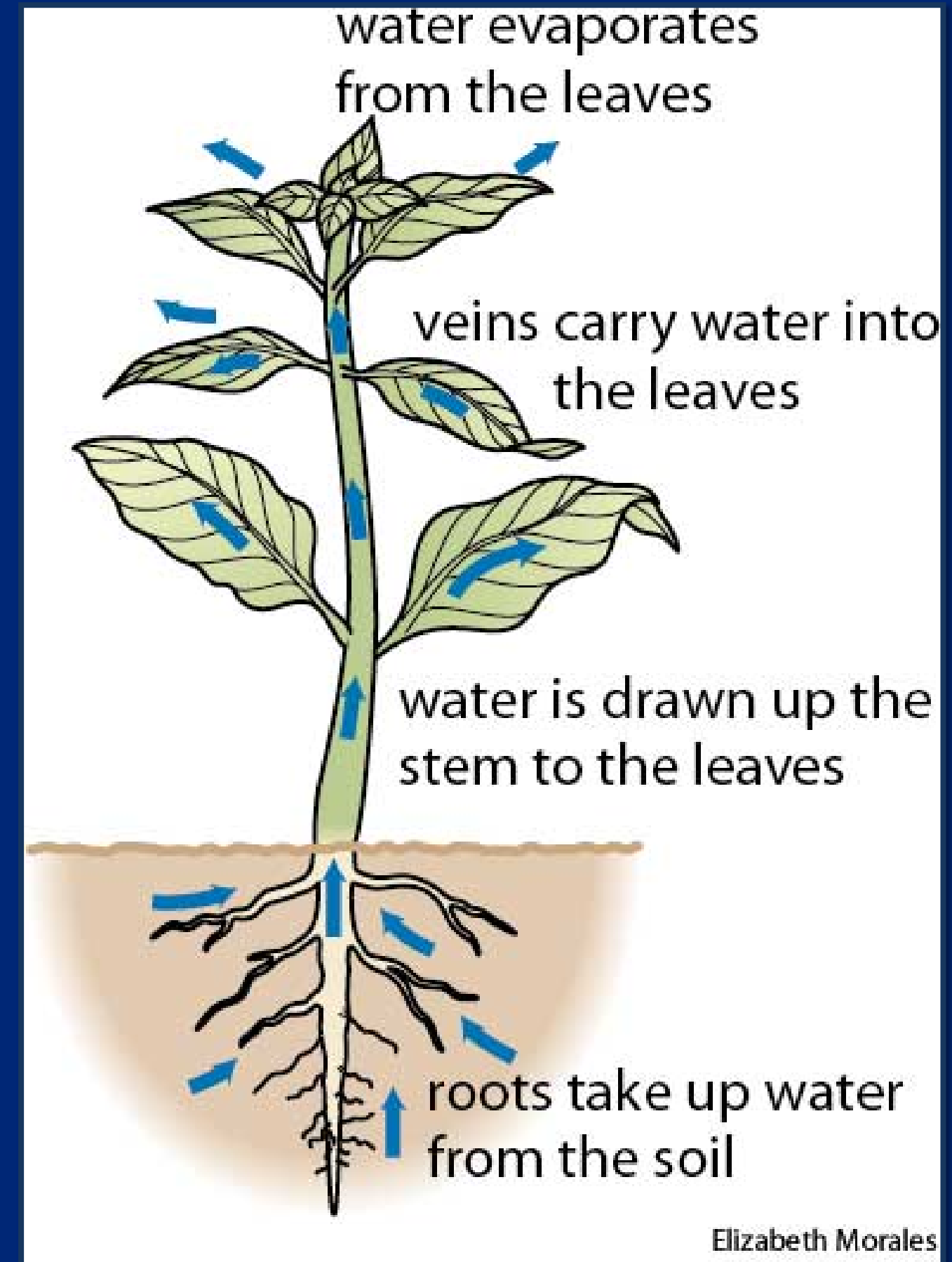
Ephemeral

Some plants can germinate when it rains and complete their entire life cycle in a few weeks or months.

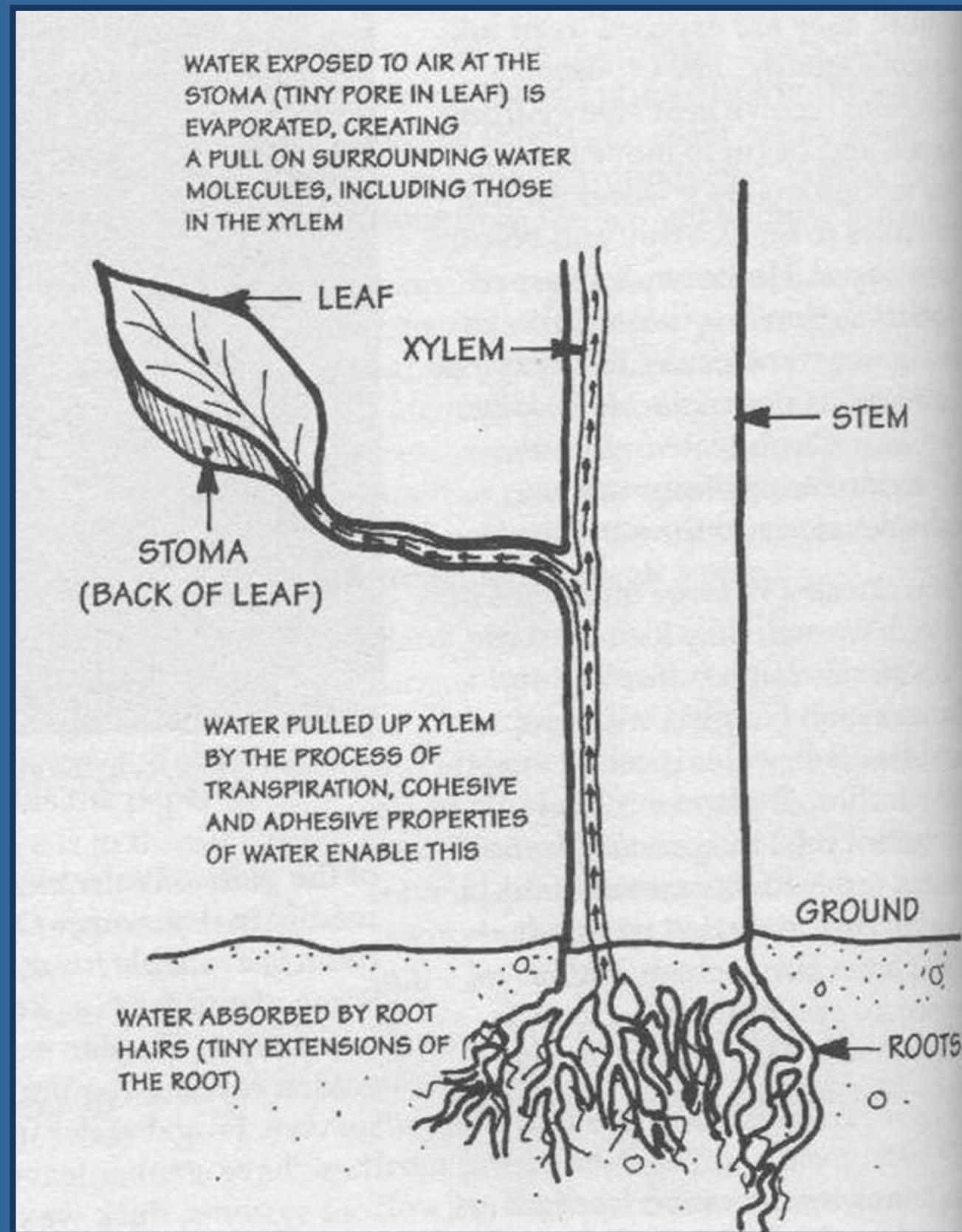
Water cycle: *Thirsty Plants* - Discovery

Plant Perspirations!

- Take students outside to go collect their bag.
 - Carefully remove one leaf from the plant and put in your bag.
 - Make observations about how much water is in the bag and share with class.
 - **How did the water in the bag get there?**



Water cycle: *Thirsty Plants* - Discovery



Transpiration

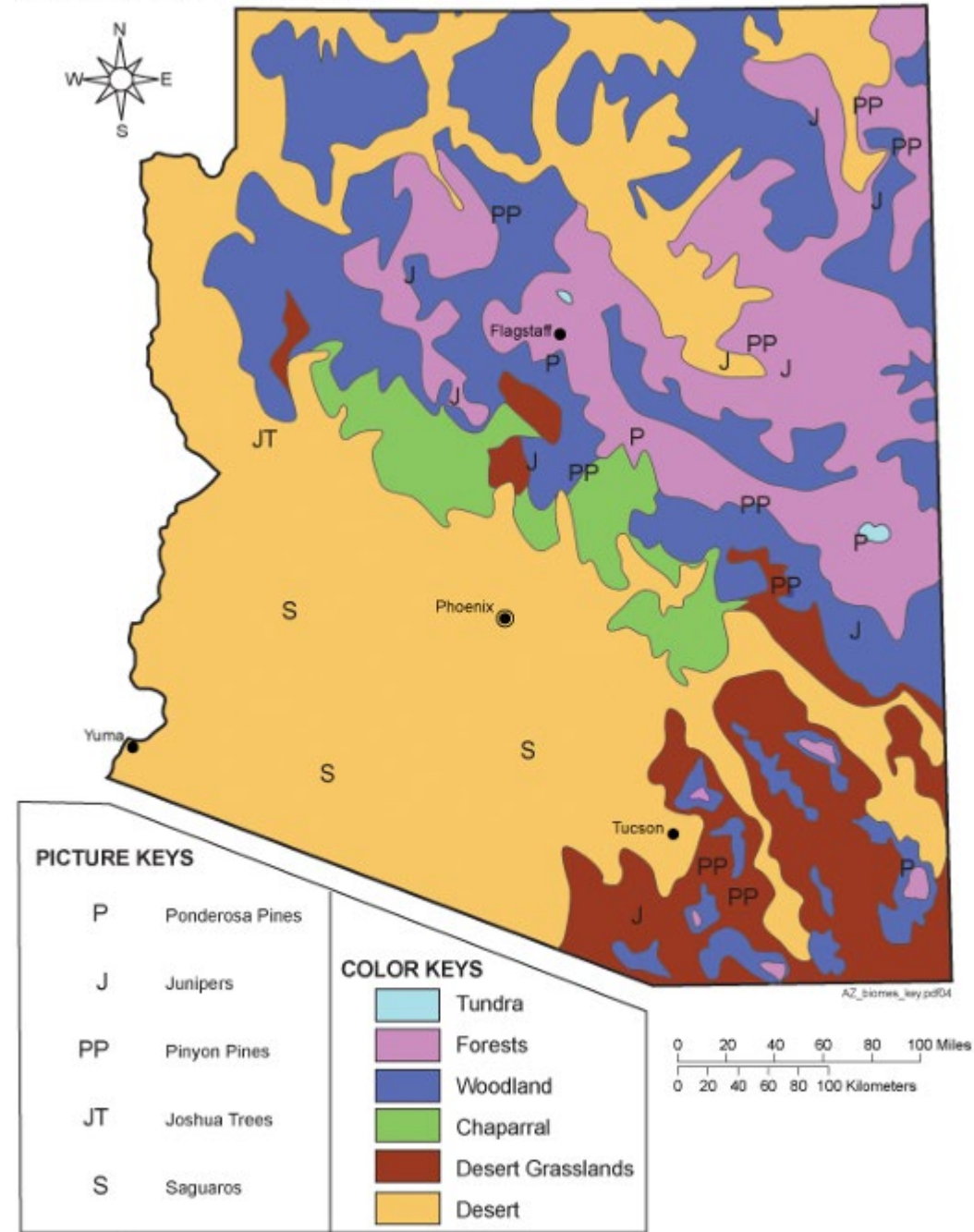
Water molecules change form from a liquid to a gas when the molecules heat up and leave a plant.

Transpiring Thoughts!

Do you think transpiration plays an important role in the water cycle & our local environment?:

- How many leaves were in your bag?
- How many leaves did you estimate were on your tree?
- How much water do you think would come from the entire tree in that same time?
- How about all the trees in your neighborhood?

Arizona's Biomes



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GEOGRAPHIC ALLIANCE

Courtesy: Arizona Geographic Alliance
Department of Geography, Arizona State University
Becky L. Eden, Chelsea Gratrix

Wrap-Up

- Now we understand what a watershed is and which one we live in here in Arizona.
 - Discuss how adaptations enable species (plants & animals) to live in this environment and your local area.
 - Summarize water and heat related adaptations into categories (avoiding heat, storing water, dissipating heat, accessing water, etc.)

**Systems and System Models
& Cause and Effect**